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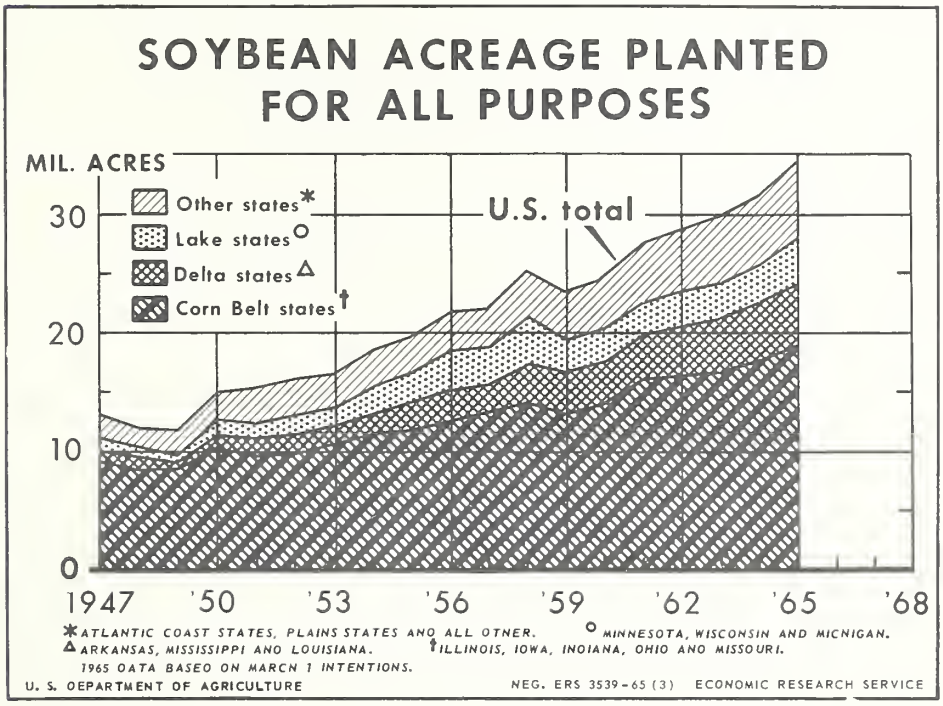
TRENDS IN U. S. SOYBEAN ACREAGE AND PRODUCTION, 1947-65

by

George W. Kromer



U.S. soybean acreage has nearly tripled in the postwar era, rising from around 12 million acres in 1947-49 to a record 34 million indicated for 1965. Important factors have been: (1) New varieties of soybeans better suited to both old and new production areas; (2) the shift of acreage formerly in oats to soybeans; (3) acreage restrictions on corn, wheat, and cotton; (4) the sharp expansion in market outlets for soybeans and products; and (5) favorable prices received by soybean producers.

Rapid increases in the Delta, Lake, and other States have reduced the relative importance of the Corn Belt States from about 70 percent of the total U.S. soybean acreage in 1947-49 to 55 percent in 1965. (See page 27).

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Soybean acreage planted for all purposes in the United States rose sharply in the postwar era from around 12 million acres in 1947-49 to about 32 million in 1964. A record 34 million acres is indicated for 1965, based on March 1 planting intentions (table 16). Soybean production during this period increased from around 216 million bushels in 1947-49 to nearly 700 million in 1964 (table 17). If farmers plant the intended acreage, and if yields are average with an allowance for trend, the 1965 soybean crop will reach a record 829 million bushels.

One of the most challenging problems facing researchers and the industry is how to raise soybean yields from the plateau on which they have remained for the past 8 years. The importance of this problem was stressed in a recent industry research advisory report to the USDA which included the following statement:

"While soybeans have been produced in the United States for over 40 years, the national yields have never exceeded 25 bushels per acre. In fact, during the past decade yields have only increased 18% compared to corn increases of 58%, cotton 60%, and grain sorghum 119%. Yet the demand for soybeans has been increasing at a rapid rate, and it is expected to increase another 50% during the next 5 years. To meet increased production requirements, growers have been expanding their soybean acreage. However, there is a limit in additional land that can be used for producing soybeans and unless there is some breakthrough in the existing yield barrier, it is doubtful if the anticipated increased domestic and foreign demand for soybeans and soybean products can be met. The yield barrier is also hampering farmers' efforts to cut production costs." 1/

Soybeans Rank Third Among U. S. Cash Crops In 1964

World War II was the principal force that sparked the expansion in soybeans and raised this oilseed to its present important status in American agriculture. Before World War II, the United States was a net importer of oilseeds, fats, and oils for both food and nonfood uses and for livestock feeds. The hostilities cut off many Far Eastern supplies while rising U. S. incomes increased the demand for meat and other livestock products. This resulted in a greater demand for protein supplies to feed the expanding livestock numbers. Development of the mixed feed industry further boosted feed demand. The demand for all fats and oils was strengthened because of the need to replace lost imports, the greater use of shortening, and the increased use of margarine as a replacement

1/ Report and recommendations submitted to the Secretary of Agriculture by the Oilseed, Peanut and, Sugar Crops Research Advisory Committee, which met in New Orleans, La., January 18-21, 1965. Copies of this report may be obtained from the Executive Secretary of the Oilseed, Peanut, and Sugar Crops Research Advisory Committee, Research Program Development and Evaluation Staff, U. S. Department of Agriculture, Washington, D. C. 20250.

Table 16.--Soybeans: Acreage, yield and production, U. S., 1947-65

Year	Acres planted: Grown alone	Acres planted: Interplanted 1/	Acres planted: Equivalent solid 2/	Acres harvested: For beans	Acres harvested: For hay	Grazed or plowed under	Yield per acre harvested: For beans	Yield per acre harvested: For hay	Production: Beans	Production: Hay
	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	Bushels	Tons	1,000 bushels	1,000 tons
1947	13,052	1,408	13,755	11,411	1,292	1,052	16.3	1.22	186,451	1,574
1948	11,987	1,259	12,617	10,682	1,111	824	21.3	1.30	227,217	1,446
1949	11,872	1,165	12,456	10,482	1,130	844	22.3	1.32	234,194	1,488
1950	15,048	1,184	15,640	13,807	963	870	21.7	1.31	299,249	1,260
1951	15,176	955	15,655	13,615	893	1,147	20.8	1.24	283,777	1,110
1952	15,958	831	16,374	14,435	1,085	854	20.7	1.10	298,839	1,191
1953	16,394	653	16,719	14,829	1,037	853	18.2	1.09	269,169	1,134
1954	18,541	663	18,872	17,047	876	949	20.0	1.04	341,075	913
1955	19,674	617	19,981	18,620	705	656	20.1	1.28	373,682	904
1956	21,700	597	21,998	20,620	524	354	21.8	1.29	449,251	675
1957	21,938	497	22,186	20,857	444	885	23.2	1.29	483,425	574
1958	25,108	484	25,350	23,993	472	885	24.2	1.43	580,250	674
1959	23,349	459	23,579	22,631	351	597	23.5	1.41	532,899	496
1960	24,449	398	24,649	23,655	449	545	23.5	1.44	555,307	646
1961	27,815	332	27,981	27,008	424	549	25.2	1.47	679,566	624
1962	28,448	290	28,593	27,604	475	514	24.2	1.37	669,211	514
1963	29,459	278	29,598	28,580	547	471	24.5	1.38	699,363	757
1964	31,677	234	31,794	30,738	531	525	22.8	1.39	699,882	738
1965 3/	34,266									

1/ Grown with other crops.
2/ Acreage grown alone, plus one half the interplanted acres.
3/ March 1 planting intentions.

Table 17--Soybeans: Supply, disposition, and price, 1947-64

Year beginning October	Supply: Production	Supply: Stocks, Oct. 1 1/: On farms	Supply: Stocks, Oct. 1 1/: Off farms	Supply: Stocks, Oct. 1 1/: Total	Supply: Total supply	Disposition: Exports	Disposition: Crushings 2/	Disposition: Used for seed: Total	Disposition: Used for seed: Per acre planted	Disposition: Feed 3/	Disposition: Residual 4/	Price per bushel: Season average received by farmers 5/	Price per bushel: Support	Production of Oil: Total	Production of Oil: Per bushel crushed 6/	Production of Meal: Total	Production of Meal: Per bushel crushed 6/
	Mil. bu.	Mil. bu.	Mil. bu.	Mil. bu.	Mil. bu.	Mil. bu.	Mil. bu.	Mil. bu.	Lb.	Mil. bu.	Mil. bu.	Dol.	Dol.	Mil. lb.	Lb.	1,000 tons	Lb.
1947	186.5	2.3	3.1	5.4	191.8	7/2.9	161.4	16.1	76	2.5	6.3	3.33	2.04	1,534	9.5	3,833	47.5
1948	227.2	1.9	.7	2.6	229.8	23.0	183.7	15.9	76	2.8	1.2	2.27	2.18	1,807	9.8	4,330	47.1
1949	234.2	2.2	1.0	3.2	237.4	13.1	195.3	18.9	77	2.5	4.7	2.16	2.11	1,937	9.9	4,586	47.0
1950	299.2	1.2	1.7	2.9	302.1	27.8	252.0	19.0	72	2.3	-3.2	2.47	2.06	2,454	9.7	5,897	46.8
1951	283.8	2.7	1.5	4.2	287.9	17.0	244.4	19.8	73	2.0	1.1	2.73	2.45	2,444	10.0	5,704	46.7
1952	298.8	2.0	1.6	3.6	302.4	31.9	234.4	20.7	72	1.8	3.5	2.72	2.56	2,536	10.8	5,551	47.4
1953	269.2	5.8	4.4	10.1	279.3	39.7	213.2	22.9	74	1.4	.8	2.72	2.56	2.350	11.0	5,051	47.4
1954	341.1	.5	.8	1.3	342.4	60.6	249.0	23.4	73	1.6	-2.1	2.46	2.22	2,711	10.9	5,705	45.8
1955	373.7	3.9	6.0	9.9	383.6	67.5	283.1	25.8	70	1.6	1.9	2.22	2.04	3,143	11.1	6,546	46.2
1956	449.3	2.0	1.7	3.7	453.0	85.4	316.0	26.4	71	1.7	13.7	2.18	2.15	3,431	10.9	7,510	47.5
1957	483.4	3.6	6.3	9.9	493.3	85.5	353.8	29.5	71	1.5	1.9	2.07	2.09	3,800	10.7	8,284	46.8
1958	580.2	2.2	18.9	21.1	601.3	110.1	401.2	27.4	70	1.9	-1.4	2.00	2.09	4,251	10.6	9,490	47.3
1959	532.9	17.1	45.0	62.1	595.0	141.4	393.4	29.3	70	1.5	6.2	1.96	1.85	4,338	11.0	9,152	46.5
1960	555.3	3.4	19.8	23.2	578.5	130.1	402.2	32.8	71	1.3	6.1	2.13	1.85	4,420	11.0	9,452	47.0
1961	679.6	1.6	4.4	6.0	685.6	153.2	438.8	33.5	70	1.1	1.4	2.28	2.30	4,790	10.9	10,342	47.1
1962	669.2	13.8	43.8	57.6	726.8	180.3	474.5	34.4	70	1.2	21.2	2.34	2.25	5,091	10.7	11,127	46.9
1963	699.4	4.0	11.1	15.1	714.4	191.1	440.9	37.3	70	1.2	12.0	2.51	2.25	4,822	10.9	10,609	48.1
1964 8/	699.9	15.2	16.8	32.0	731.8	205	470					2.65	2.25	5,100	10.8	11,200	47.7
1965 9/	829			10	839								2.25				

1/ Data include stocks on farms, at processing plants, commercial stocks at terminals, CCC stocks in transit to ports, and stocks in interior mills, elevators, and warehouses.
2/ Crushings as reported by Bureau of the Census. Some new-crop soybeans are crushed prior to October 1. These affect the size of the residual item.
3/ Fed to livestock on farms where grown.
4/ Includes cleaning and other losses, year-to-year changes in volume of soybeans crushed prior to October 1, and other statistical discrepancies.
5/ Season average price in each State for the marketing year weighted by quantities sold. Includes an allowance for unredeemed loans 1948 to date.
6/ Computed from unrounded data.
7/ Includes exports for civilian feeding abroad by the military forces.
8/ Preliminary and partly estimated.
9/ Forecast. Production estimate based on March 1 planting intentions and 1959-63 average yield per acre with an allowance for trend.

for butter. These heavy wartime demands, together with higher Government price supports, brought about increased soybean acreage and production during this period.

Soybeans have moved from obscurity in the prewar era to third place currently (1964) among cash crops in this country, outranked in value only by corn and cotton. The value of the U. S. soybean crop jumped from $0.5 billion during 1947-49 to $1.8 billion in 1964. The crop value of soybeans in 1964 surpassed that of wheat for the first time. This does not include the wheat certificate payments authorized under the 1964 wheat program. During the past 2 marketing years, exports of soybeans (including soybean oil and meal) returned more dollars to the United States than any other single agricultural commodity.

Many Factors Contribute to Uptrend in Soybean Acreage

During the postwar period, over 20 million acres have been shifted from other crops (mainly oats, corn, and cotton) to soybeans. The Corn Belt historically has been the main production area for soybeans and is likely to continue so. However, rapid acreage increases during the past 10 to 15 years in the Delta States, Lake States, and Atlantic States have reduced the relative importance of the Corn Belt. 1/

Many developments have contributed to the sharp uptrend in soybean acreage and production. No attempt is made here to rank them since all have contributed in some way. However, one of several developments that stand out predominately is the rapid expansion in market outlets for soybeans, oil, and protein meal, both at home and abroad. Because of soybeans, the United States has emerged as the leading world supplier and trader in oilseeds, oils and fats, currently accounting for 28 percent of world output and 37 percent of world exports. The United States accounts for about two-thirds of the world's soybean production and Mainland China almost one-third. Exports of U. S. soybeans and soybean oil in recent years have represented close to 95 percent of the total world exports of these commodities.

Another factor has been the favorable prices received by soybean growers. Soybeans have never been in surplus supply and in most years, market prices have averaged well above the support level.

New varieties of soybeans, better suited to both new and old production areas, have resulted in some long run increase in yields, and broadened the production area within which competitive returns could be obtained.

Another major factor has been the rapid increase in mechanization (for planting, cultivating, and harvesting) and the downward trend in horse and mule

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1/ Totals or averages for selected groups of States in each region are used for analytical purposes. These States represent the bulk of soybean production in the respective regions. The groups of States are as follows: North Central or Corn Belt--Illinois, Iowa, Indiana, Ohio, and Missouri; Lake States--Minnesota Wisconsin and Michigan; Plains States--Kansas, Nebraska, South Dakota, and North Dakota; Delta States--Arkansas, Mississippi, and Louisiana; Atlantic States--North Carolina, South Carolina, Virginia, Maryland, and Delaware.

numbers which reduced the requirements of grain feed for work stock. Farmers turned to soybeans when an alternate crop was needed to boost their incomes above the dwindling market for oats. Those who were equipped to handle small grains and row crops were able to shift readily to soybeans without additional investment in farm equipment.

Rapid Expansion in Soybean Acreage Occurs During 1960's

Soybean acreage planted for all purposes jumped from 12 million acres in 1949 to 15 million in 1950. Acreage increases then slowed somewhat each year thereafter, reaching 25 million acres in 1958. Plantings then dropped to the 23 to 24 million-acre level during 1959 and 1960. Cotton acreage expanded during these 2 years, due to the A and B Program (table 18). Corn allotments were removed in 1959.

The sharpest increase in soybean acreage has occurred in recent years, rising from about 24 million acres planted in 1960 to the record 34 million indicated for 1965. The average rate of increase during 1960-65 has been about 2 million acres per year compared with an annual rate of 1 million during the 1950's. Corn acreage has dropped sharply during the 1960's. It declined from 82 million in 1960 to 67 million in 1964 (table 18). Under the special feed grain program enacted in March 1961, farmers have diverted from 17 to 22 million acres of corn annually to soil-conserving uses during the past 4 years. During the 4 years, cotton acreage declined slightly under Government programs. As may be seen in table 18, the 8.4-million-acre increase in soybeans during 1959-64 has been offset by a comparable decline in oat acreage planted for grain.

For the country as a whole, only soybeans of the 6 crops shown in table 19 registered a gain in harvested acreage during 1949-64, gaining 192 percent during the period. Acreages of the other crops decreased--cotton 49 percent, oats 46 percent, wheat 35 percent, corn 33 percent, and hay 7 percent. Soybeans have never had acreage controls or planting restrictions.

Corn Belt Accounts for 55 Percent of Soybean Acreage Compared With 70 Percent During 1947-49

Since the end of World War II, the Corn Belt States have continued to be the major production area for soybeans but rapid increases in acreage in other sections of the United States have reduced the relative importance of the Corn Belt. The proportion of U. S. soybean acreage situated in the Corn Belt declined steadily from about 70 percent of the U. S. total during 1947-49 to 55 percent in 1965. This change occurred even while total acreage in these States continued rising from 9 million to 19 million. The annual rate of decline has slowed considerably since 1958 (table 20). The Delta, Lake, and Atlantic States are the other areas that showed significant increases in soybean acreage and production in the postwar years, especially since the mid-1950's (See cover chart).

The greatest expansion in soybean acreage outside the Corn Belt has occurred in the Delta States. Plantings during 1947-49 were relatively stable

Table 18.--U. S. planted acreage, Soil Bank acreage, and diverted acreage for selected crops, 1955-65

Year	Soybeans		Oats		Corn			
	U. S. planted	In Soil Bank: Conservation Reserve 1/	U. S. planted	In Soil Bank: Conservation Reserve 1/	U. S. planted	In Soil Bank: Conservation Reserve 1/	In Soil Bank: Acreage Reserve 2/	Diverted under Feed Grain Program 3/
	Mil. acre	Mil. acre	Mil. acre	Mil. acre	Mil. acre	Mil. acre	Mil. acre	Mil. acre
1955	19.7	---	47.5	---	80.9	---	---	---
1956	21.7	4/	44.2	4/	77.8	4/	5.3	---
1957	21.9	0.2	41.8	1.1	73.2	0.9	5.2	---
1958	25.1	0.3	37.7	1.8	73.4	1.5	6.7	---
1959	23.3	0.9	35.1	3.2	82.7	3.5	---	---
1960	24.4	1.1	31.5	4.0	81.7	4.6	---	---
1961	27.8	1.1	32.5	3.9	66.8	4.6	---	19.1
1962	28.4	1.0	29.9	3.6	65.9	4.3	---	20.3
1963	29.5	0.9	28.7	3.3	70.0	4.0	---	17.2
1964	31.7	0.6	26.6	2.4	67.4	2.8	---	22.2
1965 5/	34.3		25.1		66.9			
Change from:								
1955 to 1964	+12.0		-20.9		-13.5			
1959 to 1964	+ 8.4		- 8.5		-15.3			

Year	Wheat (all)				Cotton		
	U. S. planted	In Soil Bank: Conservation Reserve 1/	In Soil Bank: Acreage Reserve 2/	Diverted under Wheat Program	U. S. planted	In Soil Bank: Conservation Reserve	In Soil Bank: Acreage Reserve 2/
1955	58.2	---	---	---	18.0	---	---
1956	60.7	4/	5.7	---	17.1	4/	1.1
1957	49.8	0.5	12.8	---	14.3	0.1	3.0
1958	56.0	0.8	5.3	---	12.4	0.2	4.9
1959	56.8	2.3	---	---	15.8	0.5	---
1960	54.9	3.2	---	---	16.1		
1961	55.7	3.2	---	---	16.6	0.7	---
1962	49.1	2.9	---	10.7	16.3	0.6	---
1963	53.0	2.7	---	7.2	14.8	0.6	---
1964	55.0	2.1	---	5.1	14.8	0.5	---
1965 5/	56.9				14.3		
Change from:							
1955 to 1964	-3.2				-3.2		
1959 to 1964	-1.8				-1.0		

1/ A long range program for adjusting production and increasing the conservation of soil, water, wildlife, and forest resources. The farmer receives 2 payments--practice payment for conservation and payment for land taken out of production. Data are ASCS estimates based on pre-contract history. 2/ Corn, wheat, cotton, rice, most kinds of tobacco, and peanut farmers received yearly payments for reducing their harvested acreage below allotments. The program began with the 1956 crop year and continued through 1958. 3/ A special Feed Grain Program, enacted in 1961, permitted farmers to reduce their corn and sorghum acreage at least 20 percent in return for acreage diversion payments and eligibility for price support. A similar program was in effect during 1962-1964 with barley added. 4/ Data are not available. 5/ March 1 planting intentions.

Table 19.--Soybeans and other selected crops: Harvested acreages and their changes, Corn Belt, South, and U. S., selected years, 1949-1964

Crop and area	1949	Change in acreage from 1949 through 1950 1/	1953 2/	1957 3/	1960 4/	1964 5/	Percentage change 1949-64
	Million acres	Million acres	Million acres	Million acres	Million acres	Million acres	Percent
Corn Belt 6/							
Corn	33.2	-3.4	-0.4	-3.8	+1.6	-3.6	-11
Hay	13.0	+1.7	+ .8	- .1	-1.2	-1.5	-12
Oats	14.1	.0	-1.9	-3.2	-5.8	-9.3	-66
Soybeans	7.8	+2.0	+2.4	+5.2	+6.0	+9.6	+123
Wheat	8.1	-1.4	- .2	-1.8	-2.4	-2.0	-25
Total	76.2	-1.7	+ .7	-3.7	-1.8	-6.8	- 9
South 7/							
Corn	16.9	+1.2	-3.0	-5.1	-7.6	-10.1	-60
Cotton	23.3	-8.2	-3.5	-12.1	-10.9	-11.8	-51
Hay	10.4	- .6	- .4	-1.9	-2.6	- 1.8	-17
Oats	3.3	+ .1	+ .7	+1.1	- .8	- 1.5	-45
Soybeans	1.0	+ .6	+ .8	+2.3	+4.3	+ 6.0	+600
Wheat	14.0	-6.1	-4.2	-7.0	-4.9	- 5.5	-39
Total	68.9	-13.0	-9.6	-22.7	-22.5	-24.7	-36
United States							
Corn	85.6	-3.8	-5.1	-13.7	-14.0	-28.5	-33
Cotton	27.4	-9.6	-3.1	-13.8	-12.1	-13.3	-49
Hay, all	72.8	+2.3	+2.2	- .9	- 5.6	- 4.9	- 7
Oats	37.8	+1.5	- .3	- 3.7	-11.2	-17.4	-46
Soybeans	10.5	+3.3	+4.3	+10.9	+13.7	+20.2	+192
Wheat	75.9	-14.3	-8.1	-32.1	-24.0	-26.7	-35
Total	310.0	-20.6	-10.1	-53.3	-43.2	-70.6	-23

1/ Acreage restrictions on corn, cotton, and wheat. 2/ No acreage controls. 3/ Acreage restrictions on corn, cotton, and wheat. Soil Bank Program in effect. 4/ Acreage controls on cotton and wheat but not corn. Soil Bank Program in effect. 5/ Voluntary feed grain and wheat programs. Feed grain farmers were required to divert at least 20 percent of base acreage to qualify for price supports and acreage diversion payments. 6/ Illinois, Iowa, Indiana, Ohio and Missouri. 7/ Southeastern States plus Mississippi, Tennessee, Louisiana, Arkansas, Texas, and Oklahoma.

Table 20.--Soybeans: Acreage planted for all purposes, by selected groups of States, 1947-65

Year	United States		Corn Belt States 1/		Lake States 2/		Plains States 3/		Delta States 4/		Atlantic States 5/		All other States 6/	
	1,000 acres	Pct.	1,000 acres	Pct.	1,000 acres	Pct.	1,000 acres	Pct.	1,000 acres	Pct.	1,000 acres	Pct.	1,000 acres	Pct.
1947	13,052	100	9,302	71	1,187	9	348	3	749	6	728	5	738	6
1948	11,987	100	8,441	70	1,044	9	266	2	739	6	748	6	749	7
1949	11,872	100	8,294	70	931	8	346	3	729	6	767	6	805	7
1950	15,048	100	10,194	68	1,351	9	575	4	1,214	8	872	6	842	5
1951	15,176	100	9,834	65	1,326	9	649	4	1,372	9	938	6	1,057	7
1952	15,958	100	9,938	62	1,358	9	913	5	1,680	11	947	6	1,122	7
1953	16,394	100	10,656	65	1,583	10	819	5	1,435	9	976	6	925	5
1954	18,541	100	11,528	62	2,221	12	840	5	1,845	10	1,117	6	990	5
1955	19,674	100	11,934	61	2,521	13	909	4	2,141	11	1,175	6	994	5
1956	21,700	100	12,645	58	3,006	14	994	4	2,624	12	1,445	7	986	5
1957	21,938	100	13,285	61	3,065	14	768	4	2,366	10	1,498	7	956	4
1958	25,108	100	14,347	57	3,563	14	1,177	5	3,272	13	1,618	6	1,131	5
1959	23,349	100	13,326	57	2,596	11	950	4	3,643	16	1,634	7	1,200	5
1960	24,449	100	13,987	57	2,449	10	1,043	4	3,681	15	1,957	8	1,332	6
1961	27,815	100	16,138	58	2,760	10	1,345	5	3,927	14	2,205	8	1,440	5
1962	28,448	100	16,357	57	2,697	9	1,448	5	4,172	15	2,285	8	1,489	6
1963	29,459	100	16,436	56	2,851	10	1,532	5	4,675	16	2,362	8	1,603	5
1964	31,677	100	17,692	56	3,363	11	1,671	5	4,839	15	2,440	8	1,669	5
1965 7/	34,266	100	18,862	55	3,802	11	1,990	6	5,221	15	2,608	8	1,783	5

1/ Illinois, Iowa, Indiana, Ohio, and Missouri. 2/ Minnesota, Wisconsin, and Michigan. 3/ Kansas, Nebraska, South Dakota, and North Dakota. 4/ Arkansas, Mississippi, and Louisiana. 5/ North Carolina, South Carolina, Virginia, Maryland, and Delaware. 6/ Includes New York, New Jersey, Pennsylvania, West Virginia, Georgia, Florida, Kentucky, Tennessee, Alabama, Oklahoma, and Texas. 7/ March 1 planting intentions.

at about 0.7 million acres, comprising 6 percent of the total U. S. acreage. The acreage then jumped to 1.2 million in 1950 and has generally trended upward thereafter to 5.2 million in 1965 or 15 percent of the total acreage indicated for 1965.

Soybean plantings in the Lake States during 1947-49 were generally stable at around a million acres, accounting for 8 to 9 percent of total U. S. acreage. Acreage increased to 1.3 million in 1950 and trended upward to a peak of 3.6 million in 1958--14 percent of the total. Since then, acreage has been somewhat less, but March 1 intentions indicates that 3.8 million acres will be planted in the Lake States in 1965.

Acres planted to soybeans in the Atlantic States has also shown a steady uptrend, rising from 0.7 million acres in 1947-49 to a record 2.6 million indicated for 1965 or 8 percent of the U. S. total. Acreage in the Plains States has displayed a similar but smaller uptrend.

Soybean Yields Per Acre On A Plateau

Soybean yields per acre harvested for beans generally trended upward from 16.3 bushels in 1947 to a record 25.2 bushels in 1961 (table 21). The principal influences in the postwar uptrend appear to have been improved varieties and more efficient machinery in harvesting. Other factors were better management of soils, more timely operations, and other improved practices--including other phases of mechanization than harvesting alone.

Since 1957, soybean yields have remained on a plateau, the U. S. average varying between 23.2 bushels per acre that year and the 1961 peak of 25.2 bushels. (See chart, page 35). Drought reduced the 1964 crop yield to 22.8 bushels per acre. The leveling off of yields in recent years partly reflects (1) the rapid expansion of soybeans into new areas for which available varieties were not so well suited, and (2) planting of soybeans by many farmers lacking experience with the crop. In some areas of the country, too, soybeans are considered as a secondary crop behind others such as corn, cotton, rice, peanuts, and wheat. For this reason, soybeans do not always get the necessary attention, especially when it comes to the availability of machinery and time. In some parts of the South, soybean plantings follow small grains. If soybeans were the primary crop, yields probably could be raised by a more timely planting schedule and more attention.

As shown in table 21, yields of soybeans per acre are considerably higher in the Corn Belt than in other areas of the United States. However, in each of the 5 major groups of States shown, the plateau pattern of yields has been evident in recent years.

Research the Key to Breaking Yield Barrier

Long-range projections show that the demand for soybeans, soybean oil, and soybean meal will continue to increase, both domestically and abroad, requiring an annual soybean supply of a billion bushels in the early 1970's. U. S.

Table 21.--Soybeans: U. S. acreage, yield, and production, by selected groups of States, 1947-64

Acreage Harvested For Beans

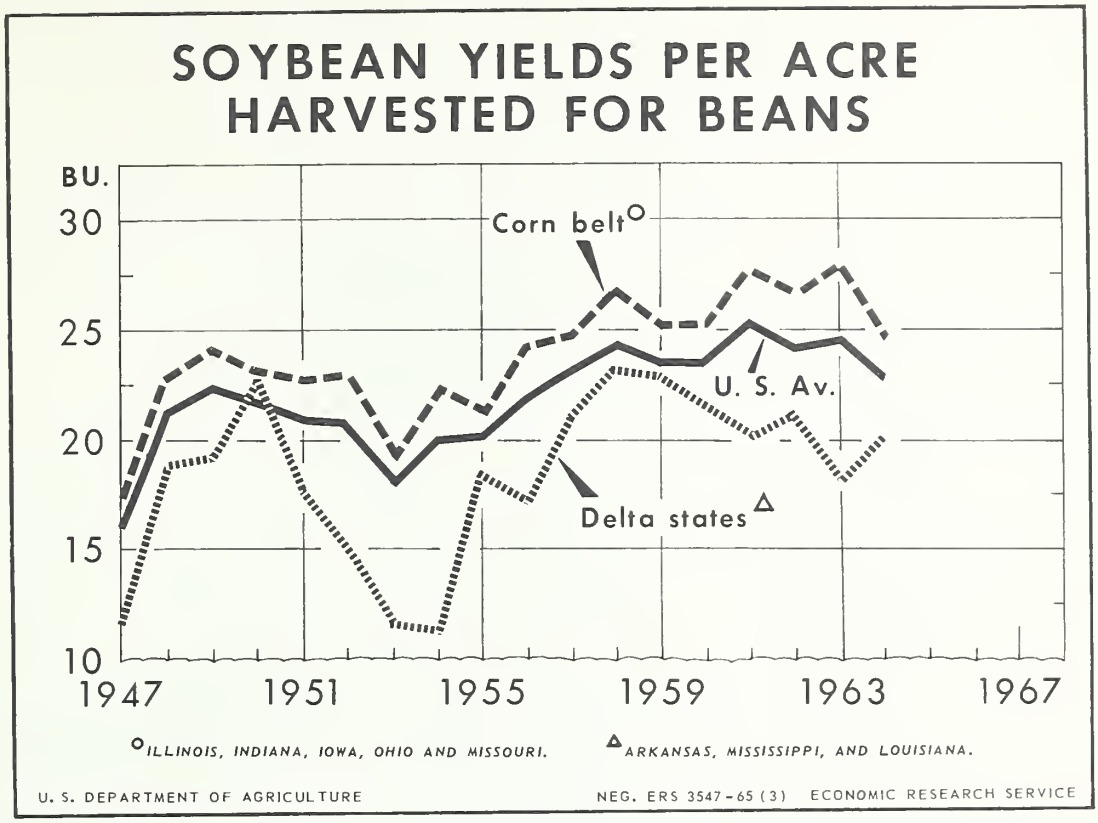
Year	United States	Corn Belt States	Lake States	Plains States	Delta States	Atlantic States	All other States
	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres
1947	11,411	8,798	1,065	318	428	463	339
1948	10,682	8,080	983	237	480	525	377
1949	10,482	7,834	851	328	499	550	420
1950	13,807	9,870	1,260	558	979	654	486
1951	13,615	9,434	1,245	547	1,080	713	596
1952	14,435	9,589	1,294	842	1,391	714	605
1953	14,829	10,241	1,517	699	1,071	748	553
1954	17,047	11,160	2,174	698	1,550	866	599
1955	18,620	11,721	2,469	846	1,931	977	676
1956	20,620	12,413	2,918	902	2,396	1,301	690
1957	20,857	13,038	2,896	717	2,191	1,331	685
1958	23,993	13,990	3,488	1,142	3,079	1,440	854
1959	22,631	13,180	2,554	924	3,505	1,479	989
1960	23,655	13,830	2,407	1,026	3,541	1,778	1,073
1961	27,008	15,930	2,735	1,305	3,795	2,022	1,221
1962	27,604	16,211	2,653	1,412	4,008	2,084	1,236
1963	28,580	16,290	2,816	1,488	4,536	2,118	1,332
1964	30,738	17,450	3,320	1,630	4,695	2,201	1,442

Yields Per Acre Harvested For Beans

	Bushels	Bushels	Bushels	Bushels	Bushels	Bushels	Bushels
1947	16.3	17.0	15.1	9.6	11.6	14.3	16.0
1948	21.3	22.6	17.9	16.1	18.9	14.0	18.9
1949	22.3	24.0	17.8	14.6	19.1	15.8	18.4
1950	21.7	23.1	15.9	17.3	22.6	16.2	18.8
1951	20.8	22.6	17.7	15.2	17.2	16.3	17.0
1952	20.7	23.0	18.9	13.4	15.1	16.3	16.8
1953	18.2	19.4	20.2	10.4	11.5	15.4	15.2
1954	20.0	22.1	21.3	14.1	11.3	14.9	13.5
1955	20.1	21.4	19.4	11.1	18.5	17.7	17.9
1956	21.8	24.3	19.9	10.7	17.2	20.1	18.3
1957	23.2	24.9	21.4	17.3	21.2	18.7	19.9
1958	24.2	26.8	17.8	19.1	23.3	21.4	22.5
1959	23.5	25.3	19.5	18.1	22.9	20.7	22.3
1960	23.5	25.2	19.4	20.6	21.4	22.3	22.4
1961	25.2	27.6	23.1	21.0	20.2	22.0	22.6
1962	24.2	26.8	19.8	19.7	21.0	20.8	21.7
1963	24.5	27.8	23.8	19.3	18.2	18.6	21.0
1964	22.8	24.7	20.0	18.5	20.0	21.5	22.0

Production From Harvested Acres For Beans

	1,000 bu.	1,000 bu.	1,000 bu.	1,000 bu.	1,000 bu.	1,000 bu.	1,000 bu.
1947	186,451	149,931	16,040	3,054	5,392	6,606	5,428
1948	227,217	182,298	17,552	3,818	9,054	7,372	7,123
1949	234,194	188,215	15,186	4,803	9,549	8,708	7,733
1950	299,249	227,698	20,027	9,651	22,162	10,589	9,122
1951	283,777	213,133	22,021	8,324	18,529	11,643	10,127
1952	298,839	220,221	24,445	11,285	21,068	11,628	10,192
1953	269,169	199,041	30,589	7,305	12,331	11,510	8,393
1954	341,075	246,570	46,237	9,871	17,448	12,865	8,084
1955	373,682	251,080	47,945	9,398	35,890	17,278	12,091
1956	449,251	301,548	58,184	9,643	41,124	26,106	12,646
1957	483,425	324,149	61,933	12,372	46,410	24,904	13,657
1958	580,250	374,651	62,185	21,798	71,676	30,749	19,191
1959	532,899	333,381	49,871	16,746	80,230	30,652	22,019
1960	555,307	347,899	46,711	21,179	75,925	39,578	24,015
1961	679,566	440,094	63,269	27,400	76,744	44,523	27,536
1962	669,211	434,595	52,636	27,749	84,067	43,389	26,775
1963	699,363	453,554	67,074	28,655	82,687	39,481	27,912
1964	699,882	430,433	66,524	30,197	93,676	47,380	31,672



production of soybeans is expected to increase also, but higher yields per acre will be needed. In recent years there has been a limit on additional land that could be used for soybeans. Higher yields will also help to reduce production costs and enable soybeans to compete more effectively for idle land and land in other crops.

A combination of both applied and basic research is needed on all phases of soybean production in order to break the so-called yield barrier. The USDA is expanding its basic farm research program for soybeans in such areas as culture, breeding, diseases, variety evaluation, pest control, weed control, and nematode control. The answer to low yields and other production problems is believed to lie in these broad fields.

One crop researcher states: "It will be uphill work to raise soybean yields from the plateau on which they have remained so long. One brillant breakthrough (or) one fundamental discovery might furnish a tremendous push. However, it's more likely that a combination of many small advances, made through the research of an augmented group of competent scientists, will make soybean acres produce more." 1/

1/ A talk by Dr. Marion W. Parker, Director, Crops Research Division, Agricultural Research Service, USDA, before the American Soybean Associations' 44th Convention, Kansas City, Mo., August 1964.

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